APPENDIX F
ORDNANCE AND EXPLOSIVES SITE-SPECIFIC SAFETY AND HEALTH PLAN

1.1 INTRODUCTION

The provisions of this Ordnance and Explosives (OE) Site-Specific Safety and Health Plan (OE SSHP) are mandatory for all personnel involved in any OE activities at the Tourtelot Project Site. This OE SSHP provides the specification for the minimum acceptable requirements for all subcontractor organizations, and notification OE, chemical, and physical hazards expected to be associated with the Earth Tech-managed activities addressed in this document.

Operational changes to the OE SSHP that could affect the health and/or safety of site personnel, the community, or the environment will not be made without prior approval of the Earth Tech Project Manager (PM), the Earth Tech Health and Safety Officer (HSO), the U.S. Army Corps of Engineers (USACE), and the Department of Toxic Substances Control (DTSC). In the event of a conflict between this Plan and federal, state, or local regulations, the more stringent requirement will apply.

This OE SSHP addresses only activities related to the identification and removal of OE-related items at the Project Site. Additional remedial activities related to the cleanup of chemical effects at the site are addressed in Earth Tech's OE SSHP for the Tourtelot Cleanup Project and OE SSHP Addendum 1, Remedial Activities and Additional Site Investigation.

1.2 POLICY STATEMENT

It is the policy of Earth Tech to provide a safe and healthful work environment for all of its employees. Earth Tech considers no phase of operations or administration to be of greater importance than injury and illness prevention. Safety takes precedence over expediency or shortcuts. At Earth Tech, we believe every accident and every injury is avoidable. We will take every reasonable step to reduce the possibility of injury, illness, or accident.

This OE SSHP presents procedures to be employed during all, on-site, work activities for the remediation of OE. The practices and procedures presented in the OE SSHP are mandatory for all Earth Tech employees (and subcontractors) while they are engaged in work operations for the remediation of OE at the Project Site. Earth Tech also requires that all visitors to areas under its control abide by these procedures.

1.3 APPLICABILITY

This OE SSHP addresses all applicable OE SSHP elements as presented in Title 8 of the California Code of Regulations (CCR) Section 5192 (b). The applicable elements include those items that are identified as part of the Work Activity Description (Section 1.5) or as potential workplace hazards that may be encountered during the performance of planned work activities. Any elements not discussed in the OE SSHP have been determined to be inapplicable to planned work activities or to present no significant worker hazards, and have therefore been omitted for clarity. Specifically, elements addressed in 8 CCR Section 5192 (b) that are not addressed in this Plan include:

- Radiation - No radiation hazards will be associated with this project
- Lighting - No OE related work will be conducted beyond normal daylight hours
- Confined Spaces - No confined space hazards are associated with this project
- Spill Response - No hazardous materials in reportable quantities will be imported or produced during this project.

1.4 REFERENCES

This OE SSHP complies with applicable Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and California Occupational Safety and Health Administration (Cal/OSHA) regulations, and standards developed for the Project Site. This OE SSHP follows the requirements found in the following documents:

- Title 29 of the Code of Federal Regulations (CFR), Part 1910 (1910), OSHA
- 8 CCR, Chapter 4, Subchapter 4 (Construction Safety Orders) and Subchapter 7 (General Industry Safety Orders)
- USACE Engineering Manual 385-1-1, Safety and Health Requirements Manual, September 1996
- The State of California, Proposition 65, Community Right-to-Know.

1.5 WORK ACTIVITY DESCRIPTION

The Tourtelot OE Remediation will investigate, detect, identify, and remove OE, OE scrap, and non-OE metallic debris from the Project Site as described in

Chapter 2.0 of the OE RDD. Project Site OE remediation will consist of five significant coordinated field activities, including:

- Surface preparation
- Point clearance of all detectable anomalies across the entire Project Site, including appropriate disposal of any OE, OE scrap, and non-OE items
- Homogenization and excavation of trinitrotoluene (TNT)-affected soil from the TNT Strips
- Areawide clearance to assure clearance of OE from areas that are planned for future residential use in the South and North Valleys and on the Ridge
- Grading to provide 14 feet of clean crushed bedrock below final site grades in future residential areas of the property.

The Project Site includes a number of smaller sites depicted on Figure 2-1 of the OE RDD.

The features of these areas are described in detail in Chapter 1.0 of the OE RDD. To facilitate prioritization of the OE remediation and the sequencing of associated tasks, the Project Site was divided into sectors. Figure 2-1 of the OE RDD presents the sector boundaries and significant features within each sector. Table 2-1 of the OE RDD presents a descriptions of each sector.

1.6 SURFACE PREPARATION

1.6.1 Surface Preparation

1.6.1.1 Vegetation Clearance.

To prepare the Project Site for surface clearance activities and geophysical mapping, the area will be cleared of vegetation to a height of 6 inches or less to enhance ground visibility and facilitate site access. Approximately 165 acres of the vegetation will be removed by mechanical means. Side-mounted mowers will be used to clear vegetation from a portion of the wetlands that is accessible to vehicle-supported equipment. The remaining 55 acres of the Project Site (including the jurisdictional wetlands) may be cleared by personnel using hand-held gas-powered weed cutters equipped with spark suppression systems (see Section 4.3, OE RDD).

1.6.1.2 Soil Stockpiles.

All previously stockpiled construction debris from the Project Site will be removed during the surface preparation phase, including construction debris from Unit D-1, the Ridge, and the North Valley stockpiles (Figure 2-2 of the OE RDD). The soils mixed in with the construction debris will remain at each stockpile location until they can be point cleared for OE. Following the point clearance of stockpile soils, the soil will either be moved and stockpiled in Sector 10B and/or Sector 10A or will be loaded into trucks and taken to a suitable landfill for disposal. Stockpiles #1, #2, and #3 in the North Valley will be transported to a landfill for disposal.

1.6.1.3 Fencing.

Any fencing on the interior of the Project Site will be removed during the site preparation. Exterior fencing will also be temporarily removed (and replaced as soon as possible) to facilitate geophysical mapping around the borders of the site.

1.6.1.4 Surveying of Grids.

Survey crews will lay out a 100-foot by 100-foot grid pattern on the entire Project Site using corner stakes to indicate grid corners. The grid system will allow geophysical and OE surface and subsurface clearance crews to accurately track their progress as they locate and clear OE, OE scrap, and non-OE metallic debris from the Project Site.

1.6.1.5 Road Grading and Maintenance.

Performance of OE remedial activities may require installation and/or maintenance of construction roads, to allow access by non-off road vehicles. Due to the potential to encounter OE during this work, the road grading will only be permitted in areas where surface clearance and joint clearance activities have been completed (see Section 1.7).

After each construction road is completed, an additional point clearance will be performed using the methods in Section 1.7.1.3, to ensure that no OE is present on the roads. A re-clearance will be required at any time re-grading of a road causes the removal of more than 6 inches of surface material.

1.7 ORDNANCE AND EXPLOSIVES REMEDIATION

OE remediation will be accomplished through detection and removal of metallic anomaly sources from the Project Site through clearance activities that include OE surface clearance, geophysical investigation and mapping, and OE subsurface clearance. QA/QC verification will include geophysical remapping of the entire Project Site and, as necessary, further OE subsurface clearance

activities. The final remediation step will be an areawide clearance of soils within future residential areas that contained or have the potential for containing OE below the surface scans. Areawide clearance will be completed using an iterative process of geophysically scanning, marking, and removing anomaly sources from soil lifts until no OE or OE scrap is encountered in two consecutive lifts.

1.7.1 Ordnance and Explosives Point Clearance

1.7.1.1 Surface Clearance.

OE surface clearance activities involve a systematic search of the ground surface visually and with hand-held geophysical search equipment using a walking sweep line to clear each grid of OE, OE scrap, and non-OE surface metallic debris.

The OE crew will identify each item as potential OE, OE scrap, or non-OE metallic items. Potential OE items will be left where found for inspection by the demolition crew. OE, OE scrap, and non-OE metallic items will be identified and handled as described in Chapter 4.0 of the OE RDD. OE scrap and non-OE metallic debris will be placed at the southwest corner of the grid in which it was found for subsequent collection and disposal as appropriate.

1.7.1.2 Geophysical Investigation and Mapping.

Geophysical performance verification tests will be performed to ensure that the instrumentation meets the performance objectives, as specified in Chapter 4.0 of the OE RDD. Geophysical data will be collected using electromagnetic (EM) instrumentation, specifically, a Multisensor Towed Array Detection System (MTADS). Where the towed array cannot be used (mainly on the steeper terrain and in portions of the South Valley wetlands), a dual-sensor, hand-towed, portable geophysical detector will be used (man-portable adjunct [MPA] MTADS). Approximately 70 percent of the Project Site will be mapped with towed array equipment; 30 percent of the Project Site will be mapped with portable equipment. Other hand-held geophysical equipment may be used to allow efficient scanning of fill material and stockpiles. Further detail regarding the use of the geophysical equipment at the site is presented in Chapter 4.0 of the OE RDD.

Geophysical and location data from a Global Positioning System (GPS) will be digitally collected and post-processed to identify anomaly locations. Identified anomaly locations will be recovered in the field using real-time kinematic (RTK) GPS instrumentation and marked for subsequent intrusive investigations.

1.7.1.3 Ordnance and Explosives Subsurface Clearance.

OE subsurface clearance includes:

- Excavation and identification of geophysical anomalies
- Removal of anomalies
- Disposal of OE and OE scrap.

Each marked location will be excavated to identify the source of the anomaly. OE dig teams will perform excavations using hand tools to uncover anomaly sources at depths between the ground surface and approximately 2 feet below ground surface (bgs), and a backhoe for anomaly sources deeper than 2 feet bgs. Anomaly sources will be categorized as OE, OE scrap, or non-OE metallic debris. A detailed description of each recovered anomaly will be recorded. All discovered OE will be explosively destroyed. The procedures for OE and OE scrap disposal are described in Chapter 4.0 of the OE RDD.

1.7.1.4 Point Clearance of Stockpiles #1, #2, #3; Ridge Stockpiles #1 through #9; North Valley Stockpiles; Stockpiles in Unit D-1 Area; Fill Areas in Sector 8; and Sector 2.

As part of point clearance activities, soil remaining from debris piles in Unit D-1 Stockpiles #1, #2, and #3, and Ridge Stockpiles #1 through #9, will be point cleared in lifts. Heavy equipment will be used to spread out the soil. The spread out stockpiles will be scanned with MPA MTADS. After scanning and removing the anomaly sources in soils from Stockpiles #1, #2, and #3, the soil will be disposed of at a suitable off-site landfill. Ridge stockpile soils and soil remaining from the stockpile in Unit D-1 will either be temporarily stored in Sector 10A or 10B or will be hauled to a suitable landfill for disposal.

Areas of the Project Site where on-site soils have been used as fill, including the Unit D-1 fill areas in Piercy Court (Sector 2) and the fill on the bottom of the North Valley (Sector 8) will be point cleared in 1-foot lifts. Each lift will be scanned with MPA MTADS geophysical equipment, and all identified anomalies will be removed and, as necessary, OE items will be disposed of. Heavy equipment will be used to remove each lift of fill soils. Point clearance will continue in lifts until all the fill material has been removed.

Excavated materials will be temporarily stored in Sector 10B until the North Valley has been prepared to accept fill soils.

1.7.1.5 Quality Assurance/Quality Control Verification.

A quality assurance (QA)/quality control (QC) check of the detection and removal efficiency of the point clearance process will be performed by re-mapping the entire site, recovering and investigating any newly discovered anomalies, and categorizing the anomaly sources. Any anomalies found during

the re-mapping will be excavated as described above. After the mapping/intrusive investigation activities are complete, a QC evaluation will be performed and documented, as outlined in Chapter 6.0 of the OE RDD.

1.7.1.5.1 Remediation of TNT-Affected Soil.

TNT-affected soils with TNT at concentration greater than 10 percent will be homogenized to a depth of 2 feet bgs or deeper, as necessary. These TNT-affected soils are located in the portion of the strips that are devoid of vegetation. The homogenization process is described in Section 4.12.3.1 of the OE RDD.

1.7.1.5.2 Areawide Clearance.

The areawide clearance activities on the Project Site will commence upon completion of OE point clearance, evaluation of OE site data, and completion of non-OE remediation activities on a grid-by-grid basis, and will include:

- Preparation of the North Valley to accept fill from the site.
- Removal of soils in future residential areas that are suspected of at one time containing OE or within 100 feet of an OE outlier. These soils will be placed as engineered fill in the bottom of the North Valley.

Areawide clearance areas will be divided into 100-foot by 100-foot grids and OE clearance procedures performed following the same task sequence as for point clearance (geophysical investigation, reacquisition, or excavation/removal. Following removal of any anomaly sources, a lift thickness that is 6 inches less than the reliable scan depth will be excavated. The excavated soils will be laid out in 8-inch lifts in the bottom of the North Valley and QC scanned. This process will then be repeated for the area being cleared, until bedrock is reached or two successive lifts show no evidence of OE or OE scrap in any of the geophysics evaluations. Detailed tasks associated with each of these activities are discussed in Chapter 4.0 of the OE RDD.

1.8 HEALTH AND SAFETY RESPONSIBILITIES

Project Site activities will be performed by Earth Tech and subcontractor personnel. The following assignments of health and safety-related responsibilities have been designated accordingly. Resumes of the project health and safety organization have been included in Appendix J of the OE RDD. The organizational structure for the OE SSHP is shown on Figure 7-1 in the OE RDD.

1.8.1 All Earth Tech Personnel

Each person is responsible for his/her own health and safety, for completing tasks in a safe manner, and for reporting any unsafe acts or conditions to his/her supervisor and/or the Site Safety Officer (SSO). All personnel are responsible for continuous adherence to these health and safety procedures and the procedures presented in Attachment A during the performance of their work. No person may work in a manner that conflicts with the letter or intent of safety and environmental precautions expressed in these procedures. After due warnings, Earth Tech will dismiss from the site any person who violates safety procedures. Earth Tech employees are subject to progressive discipline and may be terminated for blatant or continued violations. All on-site personnel will be trained in accordance with requirements specified in this document.

1.8.2 Project Engineer

The Project Engineer (PE) is ultimately responsible for ensuring that all project activities are completed in accordance with requirements set forth in the OE SSHP. The PE will confer with the designated HSO on all matters affecting health and safety. Other responsibilities include:

- Requiring a prompt and thorough investigation of all accidents
- Scheduling an Accident Review Board within 10 days of an injury involving a Workers' Compensation claim or OSHA recordability, or any accident with more than a $500 loss.

1.8.3 Project Manager

The PM has overall management authority for ensuring that all project activities are completed in accordance with requirements set forth in this plan. The PM will confer with the designated HSO on all matters affecting health and safety. Other health and safety-related duties of the PM include:

- Reading and becoming familiar with the OE SSHP
- Requiring a prompt and thorough investigation of all accidents
- Scheduling an Accident Review Board within 10 days of an injury involving a workers' compensation claim or OSHA recordability, or any accident with more than a $500 loss
- Providing day-to-day management of site work activities.

The PM is responsible for notifying all federal, state and local government and community organizations as specified in the OE RDD. The Valero plant is a minimum of 1,125 feet from the Project Site boundaries. The PM will notify the Valero Health and Safety Department prior to initiating site activities and provide contact numbers for Valero to use in the event of an accident at the refinery site.

1.8.4 Health and Safety Officer

The designated HSO is responsible for overseeing all aspects of the site safety program and for preparing the OE SSHP, site-specific safety guidance documents, or addenda to this plan. The HSO will be the designated Certified Industrial Hygienist (C.I.H.) overseeing all aspects of the site safety program, as well as preparing any site-specific safety guidance documents or addenda related to changes in site conditions or operations. The HSO does not report to the PM and is separately accountable to Earth Tech senior management for site health and safety. The HSO will act as the sole contact to all regulatory agencies on matters of safety and health. The HSO's other responsibilities include:

- General health and safety program administration
- Conducting daily project health and safety inspections
- Developing site-specific employee/community emergency response plans, as required, based on expected hazards
- Determining the level of personal protection required
- Updating equipment or procedures based on information obtained during site operations
- Establishing air monitoring parameters, as specified in Section 4.2 of OE RDD, based on expected contaminants.

1.8.5 Ordnance and Explosives Safety Manager

The Ordnance and Explosives Safety Manager (OESM) will be appointed by the PM to be principally responsible for execution of all OE operations for field activities. The OESM will have knowledge of all requirements mandated by OSHA, USACE, EPA, 8 CCR, and Earth Tech's Corporate Environmental, Health and Safety Program. The OESM will be directly responsible to the PM. The OESM is responsible for the implementation of the OE SSHP and will provide overall direction of the project OE functions for field activities. The OESM, or his/her designee, will interface with the SSO on OE safety functions of the project and will coordinate activities with the PM. In addition, the OESM will, as necessary, perform audits, surveillance, document reviews, and other OE safety functions as required to determine the continued effectiveness of the OE SSHP. The OESM will, as necessary, audit compliance with the OE SSHP and will perform OE safety reviews of selected project tasks. Other responsibilities will include, but will not be limited to:

- Developing and implementing corrective action plans to eliminate or mitigate hazards associated with OE

- Providing the OE safety portions of training sessions or briefings for site and visitor personnel

- Ensuring the proper use of personal protective equipment (PPE)

- Ensuring that all OE-related site operations are conducted in accordance with this document and with other relevant safety and health regulations and standards.

1.8.6 Unexploded Ordnance Personnel General Qualifications and Responsibilities

Earth Tech will utilize a Senior Unexploded Ordnance (UXO) Supervisor (SUXOS), SSO, and UXO technicians to provide the UXO safety support for all site OE activities including OE handling and disposal tasks as required for this project. All UXO-qualified personnel must meet the OSHA training and medical surveillance requirements as outlined in the hazardous waste operations (HAZWOPER) standard, found in 29 CFR Part 1910,120(e) and (f), as well as USACE Manual EM 385-1-1, Section 28. The positions listed below shall be responsible for the safe conduct of the OE tasks performed in support of the OE RDD.

1.8.6.1 Senior UXO Supervisor.

The SUXOS will manage the on-site manpower and equipment necessary to safely conduct the OE portion of the site operations, as well as the safety and health responsibilities listed below:

- Review and become familiar with the OE RDD, and ensure that all OE safety concerns are adequately addressed and controlled

- Provide the OE safety portion of training sessions or safety briefings

- Ensure that all OE-related site operations are conducted in accordance with this document and all other relevant safety and health regulations and standards

- Directly interface with, and relay safety and health concerns to, the Earth Tech SSO.

1.8.6.2 Site Safety Officer.

The SSO is responsible for performing the routine duties for health and safety, and will coordinate any necessary assistance from the designated HSO. The SSO will administer the OE SSHP and the applicable site-specific safety guidance document. Additional SSO responsibilities include:

- Reading and becoming familiar with the OE SSHP
- Enforcing the requirements of the OE SSHP and other applicable safety requirements
- Stopping work, if necessary, to prevent injury or illness and ensure personal and environmental health and safety
- Determining evacuation routes, and establishing/posting local emergency contact telephone numbers
- Ensuring that all applicable site personnel and visitors have received the proper training and medical monitoring before entering any controlled areas
- Presenting any tailgate safety meeting and maintaining appropriate training documentation/attendance records
- Implementing air monitoring according to directives in the OE SSHP
- Implementing changes in health and safety procedures as directed by the HSO and/or approved addenda to the OE SSHP.

1.8.6.3 UXO Supervisor (UXO Technician III).

The UXO Supervisor assigned to this project will be responsible for implementing and enforcing the OE safety and health requirements of the OE SSHP with his/her team.

1.8.6.4 UXO Technician (UXO Technician II).

The UXO Technicians assigned to this project will have the responsibility for safely conducting site operations as directed by the UXO Supervisor or SUXOS. The UXO Technicians will also comply with the OE SSHP. The UXO Technicians will immediately report the observance of any conditions that may present a known or potential hazard to site personnel.

1.8.7 Subcontractors

Each subcontractor's management will provide qualified employees and allocate sufficient time, materials, and equipment to safely complete assigned tasks. In particular, each subcontractor is responsible for equipping its personnel with any required PPE. All on-site employees of each subcontractor must meet the training and medical monitoring requirements set forth in the OE SSHP. Work operations performed by these subcontractors will be under the control of Earth Tech, who is responsible for oversight of work activities to ensure that all requirements specified in the OE SSHP are observed. Each subcontractor is

expected to operate in accordance with its own unique safety policies and procedures, to ensure that hazards associated with the performance of the work activities are properly controlled.

Hazards not listed in the OE SSHP but known to any subcontractor, or known to be associated with a subcontractor's services, must be identified and addressed to the Earth Tech PM or SSO prior to commencement of work operations. The SSO or authorized representative has the authority to halt any subcontractor operations, and to remove any subcontractor or subcontractor employee from the site for failure to comply with established health and safety procedures or for operating in an unsafe manner. Procedures to mitigate hazards not listed must be approved by Earth Tech, USACE, and DTSC.

Attachment B provides Earth Tech's *General Safety Rules for Contractors*, which will be observed by all subcontractor organizations.

1.8.8 On-site Personnel and Visitors

All personnel working for Earth Tech and its subcontractors and all visitors to active exclusion zones or controlled areas are required to read and acknowledge their understanding of the OE SSHP. All personnel are expected to abide by the requirements of the OE SSHP and cooperate with site supervision to ensure a safe and healthful work site. Any personnel that are not members of the Earth Tech project team or members of the subcontractor team will be considered visitors. Visitors to the site will comply with the general requirements listed below. The Earth Tech SSO and SUXOS will be notified of the nature and duration of the visit. Personnel must immediately report any of the following to the PM:

- Accidents and injuries, regardless of severity
- Unexpected or uncontrolled releases of any hazardous substances
- Any symptoms of exposure to a hazardous substance
- Any unsafe or malfunctioning equipment
- Any changes to site conditions that may affect the health or safety of project personnel
- When any non-essential personnel are in a designated OE area, all OE operations shall cease until the visitor has departed the area
- If an unauthorized visitor attempts to enter a work area, all OE and non-OE work in that area shall cease and the Earth Tech SUXOS and SSO will be notified immediately.

1.9 HAZARD ASSESSMENT

Planned activities for the site can be divided into three primary categories:

- Surface Preparation
- Geophysical Mapping
- OE identification, removal, and disposal.

Several individual work tasks are associated with each of these categories, the hazards of which are analyzed below and in Attachment A.

Potential hazards associated with the overall work activities include, but are not limited to:

- Explosive hazards due to OE.
- Explosive hazards due to soils containing explosive compounds in excess of 10 percent.
- Exposure to environmental contaminants (metals, polynuclear aromatic hydrocarbons [PAHs], and dioxins/furans). Table 2-1 provides the contaminants of concern by location and concentration range. Volatile chemicals are not anticipated to be found on this site.
- Hazardous noise (from heavy equipment).
- Slip, trip, and fall hazards.
- Heat stress, especially when wearing chemically protective clothing.
- Biological hazards from animals, insects, and plants.
- Cleaning and decontamination of equipment.

Note: Soil containing TNT in excess of 10 percent is considered to be OE in accordance with ER-1110-1-8153. Personnel should avoid contact with soils containing an excess of 10 percent TNT. Figure 1-4 of the OE RDD of the OE RDD shows the location of TNT strips where such soils may be encountered. Spark, flame, and heat-producing items and activities are not permitted in these areas. Sampling boring or drilling in the TNT Strips will not be performed until the soil has been wetted with water.

Note: The PM or SSO will inform all personnel prior to entering the Project Site of the potential health effects associated with the use of the medication “Viagra” on a site with explosive constituents. Personnel using the medication Viagra are required to wear Modified Level D PPE at all times while on site. Health hazards due to dermal absorption of explosives while taking Viagra can cause severe

illness and death. All personnel are required to wear at least Modified Level D PPE while performing sampling activities to prevent contact with explosive constituents.

Note: Soil containing TNT in excess of 10 percent cannot be shipped. Soil in excess of 10 percent must be treated on site to reduce the TNT content.

1.9.1 Task Hazard Assessment

The following is a description of the hazards determined to be associated with each identified work task to be performed for surface preparation, point clearance, homogenization and excavation of TNT-affected soil, areawide clearance, and grading. Attachment C provides a hazard analysis of the specific tasks associated with each major activity of the OE RDD. In evaluating the site conditions (on-site contamination) and the potential impact on personnel performing this work, it was determined that of the possible related exposure modes, skin contact and skin absorption is of primary concern, ingestion and inhalation are determined to be of only secondary concern. To prevent inhalation hazards, dust control measures will be used as necessary for all sampling, removal, and remedial activities. Additionally, monitoring for dust will be performed in accordance with the specifications in Section 4.2 of the OE RDD.

In evaluating the task hazards, it is anticipated that site personnel wearing the required PPE will not come into direct contact with significant amounts of contaminated soil or water that would present a skin contact hazard. Task hazard analyses (THAs) designed to meet USACE and DTSC requirements are presented in Attachment C. Table 1 provides a list of the potential contaminants for each site to be remediated and the appropriate PPE for work at each site. It should be noted, that Level D PPE is appropriate for all work to be performed on site except for remediation of the unvegetated portions of the TNT Strips. Modified Level D PPE will be required for work at this site.

Grid staking, vegetation removal, and fence installation and removal, will be performed with an OE escort.

In the event of inclement weather (rain or snow), the SSO will determine when field operations must cease. In the event of an electrical storm within 5 miles of the Project Site, all activities will cease and all field personnel will report to the Command Post for further instruction.

Manual OE excavations will be performed by OE-qualified persons only. Mechanical OE excavations will be performed by a heavy equipment operator under the direction of an OE-qualified person.

1.9.1.1 Site Reconnaissance.

This work includes delineation and staking of work area boundaries, identification of subsurface structure locations, and similar work. Because site reconnaissance is a nonintrusive activity, it provides little potential for the release or contact with contaminated materials, and OE. An OE escort will lead the vegetation removal operation in accordance with the procedures described in the OE RDD.

The primary hazards associated with this work are the potential for encountering OE, and slip, trip, and fall hazards due to the presence of unprepared walking surfaces. Other hazards that may be encountered include heat stress and sunburn. To protect against these hazards, the following requirements should be met:

- Do not touch, move, or disturb any material or equipment that is unidentifiable.
- Watch carefully where you walk. Do not step in shadows until you are sure of your footing. Shadows may hide pits, holes, or other areas of unstable footing.
- Carefully choose your footholds when crossing rocky, vegetation-covered, uneven, or loose ground surfaces.
- Stay within site of your buddy.

1.9.1.2 Vegetation Removal.

Prior to field activities, it will be necessary to remove surface vegetation across the site. This will be accomplished using both manual methods (hand-held, manual and gas-powered tools) and by mechanical means (dozer-towed flailing machine). The Project Site will be cleared of vegetation to a height of 6 inches or less. The majority of the vegetation will be removed by mechanical means, either with a brush hog or a flailing machine pulled behind a track-mounted dozer. OE personnel will be required to escort the vegetation removal teams during this task in accordance with the procedures in Chapter 4.0 of the OE RDD. Areas that cannot be accessed by mechanical equipment will be cleared by crews using gas-powered weed cutters (equipped with spark suppression systems). Because vegetation removal is a nonintrusive activity, it provides little potential for the release or contact with contaminated materials or OE. The primary hazards associated with this activity include the potential for contacting OE, eye, and skin hazards from flying objects from the cutting of vegetation, noise, and slip, trip, and fall hazards due to unprepared walking surfaces. The use of powered cutting equipment also presents some danger to the operators due to the sharp cutting surfaces, and some power equipment may present a noise exposure hazard. Only experienced operators shall be permitted to operate powered equipment. Use of leather work gloves and eye protection (and hearing protection where

necessary) will be required of personnel performing vegetation removal activities. Other hazards include weather-related hazards and dangerous animals and plants.

- Do not touch, move, or disturb any material or equipment that is not identifiable.
- Watch carefully where you walk. Do not step into shadows until you are sure of your footing. Shadows may hide pits, holes, or other areas of unstable footing.
- Follow the instruction and path of the OE escort.
- Wear appropriate PPE (Level D), leather palm working gloves and hearing protection.

1.9.1.3 Fence Removal and Installation.

The fencing subcontractor will remove all interior fencing and remove and replace all fencing in concert with the geophysical mapping teams. At the end of each work day, temporary fencing will be used to close any breaches in the perimeter fence. The OE escort will be required for replacement of fencing. The primary hazards associated with this activity include potential contact with OE, lifting, and sharp metal objects. Additional hazards include slip, trip, and fall hazards due to unprepared walking surfaces, weather-related hazards, and dangerous animals and plants.

- Install fence posts only where the OE escort has determined the location to be free of anomalies.
- Watch carefully where you walk. Do not step into shadows until you are sure of your footing. Shadows may hide pits, holes, or other areas of unstable footing.
- Follow the instruction and path of the OE escort.
- Wear appropriate PPE (Level D), leather palm working gloves, and hearing protection.

1.9.1.4 Location and Marking of Search Grids.

Surveyors will install semipermanent markers (36-inch survey stakes) in lines at 100-foot intervals. Qualified UXO personnel will be required to escort the surveyors during this task in accordance with procedures in Chapter 4.0 of the OE RDD. The OE escorts will visually check the surface along the paths the surveyors use to transit the property for OE and check the subsurface area (using a White Pulse Induction metal detector) where the stakes will be driven for anomalies. The location of anomalies will be avoided by a safe distance (24-36

inches) during installation of survey stakes. Any discovered OE will be marked and reported to the SUXOS and PM for recording and disposal disposition. The primary hazards associated with this activity is potential OE contact. Additional hazards include slip, trip, and fall hazards due to unprepared walking surfaces, weather-related hazards, and dangerous animals and plants.

- Do not touch, move, or disturb any material or equipment that is not identifiable.
- Install markers only after the OE escort has determined the location to be free of anomalies.
- Watch carefully where you walk. Do not step into shadows until you are sure of your footing. Shadows may hide pits, holes, or other areas of unstable footing.
- Follow the instruction and path of the OE escort.
- Wear appropriate PPE (Level D).

1.9.1.5 Ordnance and Explosives Surface Clearance.

Once grids have been established throughout the Project Site, an OE surface clearance will be conducted. OE crews will use magnetometers and visual search methods to clear the area of OE, recognizable OE scrap, and metallic surface debris that would impact subsurface mapping. OE items will be flagged for disposal operations. The primary hazards associated with this activity include potential contact with OE, lifting, and sharp metal objects. Additional hazards include slip, trip, and fall hazards due to unprepared walking surfaces, weather-related hazards, and dangerous animals and plants.

- Only OE personnel will perform this activity.
- Do not touch any potential OE. All potential OE will be flagged for the Disposal Team.
- Install flags only after the location has been determined to be free of anomalies.
- Watch carefully where you walk. Do not step into shadows until you are sure of your footing. Shadows may hide pits, holes, or other areas of unstable footing.
- Wear appropriate PPE (Level D).

1.9.1.6 Geophysical Detection, Mapping, and Anomaly Reacquisition.

Geophysical detection, mapping, and anomaly reacquisition are associated with point and areawide clearance activities. The primary hazards of the nonintrusive

geophysical detection are associated with the possible, detonation of OE items due to mechanical disturbance of fuzed, armed OE. There is a minor risk of detonation of OE with the interaction of electronic fusing devices due to interaction with electromagnetic fields produced by geophysical instruments. To prevent this, care will be taken during collection of geophysical data to insure no intrusive actions occur (e.g. digging to remove rocks or vegetation). Although the project area will have been surface cleared of OE, there will always be the possibility of near-surface items being uncovered by either natural or man-made events. The geophysical team (and all personnel on-site) will be continuously vigilant to ensure no accidental disturbance of on-site exposed OE occurs. Additionally all use of geophysical instrumentation will be in accordance with Section 1.11.7 guidelines.

Additional hazards include slip, trip, and fall hazards due to unprepared walking surfaces, weather-related hazards, and dangerous animals and plants.

- Watch carefully where you walk. Do not step in shadows until you are sure of your footing. Shadows may hide pits, holes, or other areas of unstable footing.

- Install flags only after the location has been determined to be free of anomalies.

- Wear appropriate PPE (Level D).

1.9.1.7 OE Subsurface Clearance.

During any subsurface clearances, a minimum separation distance (MSD) will be enforced (see Section 4.1) OE RDD. OE subsurface tasks are associated with point and areawide clearance Near-surface anomaly sources are those that are partially exposed or suspected to be within 1 foot of the surface and that can be excavated using hand tools. These anomalies will be excavated by carefully removing the earth overburden using a hand shovel/trowel or other small digging implement. Throughout the excavation the UXO Technicians will use a site-tested detection instrumentation to check and verify the proximity of the anomaly. The primary hazards associated with this activity include potential contact with OE, lifting, and sharp metal objects. Additional hazards include noise, slip, trip, and fall hazards due to unprepared walking surfaces, weather-related hazards, and dangerous animals and plants.

Subsurface anomalies are those caused by sources that are more deeply buried or that may require excavation using heavy equipment (e.g., backhoe). For these excavations, an UXO Supervisor will coordinate equipment requirements with the SUXOS. Prior to the arrival of the heavy equipment, the UXO Supervisor will ensure that a cleared entrance and egress path is available for the heavy equipment. Heavy equipment or manual digging tools will be used to excavate the earth overburden in 6-inch lifts. After each lift, the anomaly location will be redefined with a site-tested metal detector and the anomaly source exploratively

sought using hand tools. This process will continue until the source of the anomaly has been uncovered and identified.

When a UXO Technician is checking backhoe excavations for suspected OE-source proximity, the backhoe budget will be placed on the ground, away from the excavation, and the operator will keep his/her hands clear of the operating controls. The backhoe operator will resume excavation operations only after the UXO Technician is clear of the excavation and outside of the bucket swing area.

- All excavations will be performed in accordance with standard OE excavation procedures outlined in the OE RDD.

- All excavations will be performed by OE personnel, with the exception of heavy equipment excavation, which will be performed under the direction of the UXO Supervisor.

- Watch carefully where you walk. Do not step into shadows until you are sure of your footing. Shadows may hide pits, holes, or other areas of unstable footing.

- Wear appropriate PPE (Modified Level D).

1.9.1.8 Backfill.

After the anomalies have been removed and the excavation has been verified to be free of anomalies the excavation will be backfilled using hand shovels or heavy equipment. The backfilled soil will be hand tamped and leveled to approximate existing ground contours. The primary hazards associated with this activity is lifting. Additional hazards include noise, slip, trip, and fall hazards due to unprepared walking surfaces, weather-related hazards, and dangerous animals and plants.

- Watch carefully where you walk. Do not step into shadows until you are sure of your footing. Shadows may hide pits, holes, or other areas of unstable footing.

- Wear appropriate PPE (Level D).

1.9.1.9 OE Scrap and Metallic Debris Disposal.

OE scrap and metallic debris disposal tasks are associated with surface, point and areawide clearances.

During operations, OE scrap and metallic debris will be placed at the southwestern corner of each grid adjacent to the grid stake. The OE scrap collected during field activities will be stored in a lockable storage shelter that will be locked at the close of each business day. The primary hazards associated with this activity include

potential contact with OE, lifting, and sharp metal objects. Additional hazards include slip, trip, and fall hazards due to unprepared walking surfaces, weather-related hazards, and dangerous animals and plants.

- All OE scrap and metallic debris will be inspected by the UXO Supervisor prior to leaving the grid.
- Watch carefully where you walk. Do not step into shadows until you are sure of your footing. Shadows may hide pits, holes, or other areas of unstable footing.
- Wear appropriate PPE (Level D).

1.9.1.10 OE Identification and Disposal.

Upon finding a potential OE item, a disposal team consisting of the SUXOS, SSO and a UXO Supervisor will positively identify the item. The disposal team will determine if the item is safe to move. Safe to move and blown-in-place (BIP) items will be handled in accordance with the OE RDD. Prior to handling OE, an MSD will be established. The primary hazards associated with this activity include contact with OE, explosives handling, fragmentation, lifting, and sharp metal objects hazards. Additional hazards include slip, trip, and fall hazards due to unprepared walking surfaces, weather-related hazards, and dangerous animals and plants.

- All OE will be identified by the disposal team prior to moving or BIP.
- The MSD will be established, and residential/business relocation will be administered as specified in Minimum Separation Area Notification and Implementation Plan (MSAP) (see OE RDD Appendix C).
- All OE disposal activities will be performed by UXO personnel only. OE teams will maintain a minimum separation distance of 200 feet.
- All non-OE personnel will be outside of the MSD during all disposal activities.
- Disposal activities will be performed in accordance with the OE RDD.
- Watch carefully where you walk. Do not step into shadows until you are sure of your footing. Shadows may hide pits, holes, or other areas of unstable footing.
- Wear appropriate PPE (Level D).

1.9.1.11 Homogenization, Excavation, Stockpiling, and Transporting of TNT-Contaminated Soils.

Homogenization, excavation, stockpiling and transporting of TNT-contaminated soils will be conducted in accordance with Section 2.12 of the OE RDD. During TNT Strip homogenization activities, an MSD will be established. Due to the explosive potential of soils containing TNT at concentrations of 10 percent or greater within the TNT Strips, the strips will be homogenized before excavation, stockpiling, or transporting of the contaminated soils takes place.

- All work will be conducted in strict accordance with this OE SSHP.
- During the homogenization of TNT-affected soil, all mobile equipment will be rubber-tired.
- Equipment utilized during homogenization, excavation, and material-handling will have smooth-lipped buckets.
- Equipment used to homogenize and excavate explosives-affected soils will have sealed bearings and shielded electrical juntion boxes. Equipment will also be decontaminated routinely to prevent the buildup of dust.
- Application of spray water for dust control and reducing the potential for ignition or detonation will be applied at TNT-affected soil handling points. The criteria for success of the dust control efforts shall be the absence of visible airborne dust and the confirmation that the quantity of dust at the perimeter of the Project Site is below action levels. PM_{10} sampling has a minimum 24-hour duration. Pre-wetting of excavation areas will be of primary concern, followed by additional wetting at other locations, such as the staging area, as required. A full-time water truck will be dedicated to the TNT Strips area.
- All vehicles (trucks) utilized to transport TNT-affected soils will use bottom dump gate tarps, or equal, to negate soil spillage.
- Stationary equipment in close contact with TNT-affected soils (e.g., high-pressure steam cleaners, trailers) will be grounded.
- Fuel will be stored outside the MSD. Fuel trucks will not enter the MSD. Fuel will either be provided in OSHA-approved 5-gallon fuel containers or by a hose that will be passed across the MSD boundary to refuel heavy equipment as necessary. During refueling operations, any equipment that will be moved outside the MSD (including fuel containers and fuel hoses) will be decontaminated if it comes in contact with the ground.

1.9.1.12 Equipment Decontamination.

Equipment used in the excavation of OE will require decontamination prior to leaving the Project Site. Only portions of the equipment contacting subsurface

soils will require cleaning, which can be accomplished using physical removal methods including brush removal, wiping, and/or use of a steam cleaner unit.

This task presents no significant inhalation or skin exposure hazards. However, personnel should be trained in the use of the steam cleaner, which has exposed, hot surfaces during use. The pressurized hot water stream can cause significant physical and thermal injury if sprayed on exposed skin; consequently, personnel not involved in clean-up should not be present in any work area where a steam cleaner is in use.

To provide further protection, personnel will use the Level D ensemble (Section 1.13), modified by the use of a face shield and chemically protective nitrile gloves.

1.9.1.13 Management/Handling of Derived Waste.

Work activities will generate decontamination fluids, waste PPE and decontamination materials, and excess sediment. Waste will be containerized and placed into drums. Handling of waste presents a minimal potential for skin contact; inhalation is not expected to present a hazard.

1.9.1.14 Unanticipated Work Activities.

Where work activities are identified that are not addressed in the OE SSHP, appropriate safety documentation and procedures will be implemented. Prior to initiation of work activities, any subcontractor organization tasked with performance of such work will submit a work procedure document that presents appropriate safety procedures applicable to the specific work activities to be undertaken. Submitted safety procedures will be reviewed for adequacy and compliance with applicable regulatory requirements and the requirements presented in the OE SSHP. Work will not be initiated until this review is completed and any identified deficiencies corrected.

1.10 GENERAL HEALTH AND SAFETY PROGRAMS

All Earth Tech and subcontractor personnel performing work in controlled areas of the Project Site will be qualified as HAZWOPER workers. Accordingly, the requirements outlined in the following subsections will apply for all personnel performing any controlled-area work operations. The controlled area includes all areas within the Project Site except the Project Site office and the access road leading the Project Office.

1.10.1 Medical Screening and Health Surveillance

All Earth Tech and subcontractor personnel will have completed a HAZWOPER physical exam in accordance with the requirements of Earth Tech Health and Safety Procedure HS601, Medical Surveillance (Attachment D), which conforms to

the requirements of 8 CCR Section 5192(f). Each person's most current exam will have been completed within the previous 365 days, and based on those exam results, each person will be medically authorized to perform HAZWOPER activities and wear approved respiratory protection by an occupational physician. The minimum medical screening will include a complete physical examination and may also include additional tests (e.g., CBC with Differential, chest X-rays, nitrogen/nitrate) as deemed necessary by the physician. A Pulmonary Function Test will be performed for all personnel who may be required to utilize respiratory protection.

1.10.2 Training Requirements

All personnel on site will meet the following training requirements.

1.10.2.1 General Training Requirements.

All field personnel and visitors involved with site activities will have completed the necessary HAZWOPER training requirements as specified in Earth Tech Health and Safety Procedure HS301, HAZWOPER Training and Refresher (Attachment E), which conforms to the provisions established in 8 CCR Section 5192(e)(2) and (e)(3) (40-hour or 24-hour initial training), 8 CCR Section 5192(e)(8) (annual refresher training), and 8 CCR Section 5192(e)(4) (supervisor training). General and daily site workers engaged in hazardous substance removal or other activities that expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of off-site instruction, and a minimum of 3 days actual field experience under the direct supervision of a trained, experienced supervisor.

Workers that are on site only for an occasional, specific, limited task (such as, but not limited to, land surveying, fence installation/removal, or geophysical surveying) will receive a minimum of 24 hours of off-site instruction, and a minimum of 1 day of actual field experience under the direct supervision of a trained, experienced supervisor. Proof of training will be maintained on site for all personnel. Outlines of 40-hour Hazardous Waste Operations, cardiopulmonary resuscitation (CPR)/First Aid, and Explosive Ordnance Disposal (EOD) (UXO) Training are included in Attachment F.

1.10.2.2 Initial Orientation Training.

Prior to the start of on-site activities, all Earth Tech and subcontractor personnel will attend a site safety/orientation briefing, to be conducted by the SSO. This training will address all elements of the site health and safety program (as presented in the OE SSHP and referenced Earth Tech and regulatory health and safety requirements). This training will also include instruction in:

- Toxic and physical hazards associated with OE and identified environmental chemicals of concern (COCs)

- Anticipated exposure hazards (as determined based on analysis of work operations and site chemical concentrations)
- Requirements and rationale used in the selection of safety equipment
- On-site monitoring procedures
- Decontamination procedures
- Care and use of selected PPE
- Emergency Notification and Response Procedures.

The training content and a list of all attendees will be documented and maintained with the project files.

Worker personnel initially assigned to the site after work operations have commenced will be provided with orientation training by the SSO that will address the above requirements. All visitors to the site (personnel not assigned to work on site) will be provided with an abbreviated version of this training, along with specific orientation as to the hazards present on site at the time of the visit and any applicable safety requirements (e.g., escorts).

1.10.2.3 Tailgate Safety Briefings.

A tailgate safety briefing will be conducted at the start of each work day. The SSO will conduct the tailgate safety briefings and will review and discuss the health and safety issues associated with the day's planned work activities, problems encountered, and modifications to existing procedures. Documentation of the tailgate safety briefings will be accomplished by using the Tailgate Safety Briefing Sign-in Log, a copy of which is included in Attachment G. The SSO will maintain copies of all tailgate safety briefing sign-in logs in the project files. All field personnel associated with each day's project activities are required to attend these meetings.

1.10.2.4 Hazard Communication Training.

Section 1.10 provides information concerning physical and environmental hazards that are expected to be encountered during the planned work operations. Material Safety Data Sheets (MSDSs) for COCs are in Attachment H. In addition, any organization wishing to bring any hazardous material onto any Earth Tech-controlled work site must first provide a copy of the item's MSDS to the SSO for approval and filing (the SSO will maintain copies of all MSDSs on site). In accordance with the requirements of 8 CCR Section 5194, all personnel will be briefed on the hazards of any product they use and will be aware of and have access to all MSDSs.

1.10.3 General Site Safety Rules

The following general requirements apply to all on-site activities (including work occurring outside controlled work areas).

1.10.3.1 Smoking, Eating, and Drinking.

Smoking, eating, and drinking will not be permitted except in specifically designated areas of the site, which shall be outside any designated exclusion zones or other designated work areas. Field workers will perform proper decontamination procedures when leaving an exclusion zone prior to eating or drinking. Consumption of alcoholic beverages is prohibited everywhere on the Project Site.

1.10.3.2 Site Awareness.

Site personnel will be familiar with the physical characteristics and requirements of the work site, including ongoing activities of other personnel at the Project Site, that may affect their work area. Personnel will also be aware of:

- Emergency procedures and evacuation assembly points
- Locations of protective and emergency equipment and relevant first-aid procedures.

The number of personnel and equipment in work areas should be minimized, consistent with site operations.

1.10.3.3 Buddy System.

All on-site personnel will operate using the two-man concept (buddy system). All personnel will operate in teams of two or more (a single-man entry into any controlled work area is prohibited); team members will maintain visual contact with each other at all times. Team members must observe each other and should be alert for signs of heat stress or toxic exposure.

1.10.3.4 Fire Prevention.

Open flames, smoking, and other sources of ignition are not authorized at any designated fieldwork area. Smoking will be permitted only in designated areas. Prior to commencement of the field investigation, Earth Tech will notify the appropriate local fire agencies and departments of specific work areas and activities.

1.10.3.5 Housekeeping.

During site activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. At no time will debris or trash be intermingled with waste PPE or contaminated materials. Anyone observed disposing of contaminated material or PPE with municipal wastes will be removed from the site.

1.10.3.6 Personal Hygiene.

At a minimum, an adequate supply of personal hygiene equipment will be available for use by site personnel. Personal hygiene items will include the following:

Water Supply

A water supply meeting the following requirements will be utilized:

Potable Water. An adequate supply of potable water will be available for field personnel consumption. Potable water can be provided in the form of water bottles, canteens, water coolers, or drinking fountains. Where drinking fountains are not available, individual-use cups will be provided as well as adequate disposal containers. Potable water containers will be properly identified in order to distinguish them from nonpotable water sources.

Nonpotable Water. Nonpotable water may be used for handwashing and cleaning activities but will not be used for drinking purposes.

Toilet Facilities

Approximately four portable toilet facilities will be provided, (three for men and one for women). These facilities will be cleaned and maintained on a regular schedule.

Washing Facilities

Employees will be provided with washing facilities (e.g., buckets with water and Alconox) at each work location. Water and hand soap (or a similar substance) will be used by each employee upon exiting any controlled work area, prior to breaks, and at the end of daily work activities.

1.10.3.7 Drum Handling.

Where containers of a capacity greater than 10 gallons are used for containerizing chemical products or waste materials, their handling will be accomplished in accordance with the following:

- When not in use, drums/containers will be covered with a tight-fitting lid.
- At the conclusion of each work shift, all drums/containers will be placed in the designated storage area. This area will be identified prior to the start of work activities and properly indicated on site plans/diagrams. Information pertaining to the location of storage areas and their contents will be properly conveyed to all personnel and appropriately annotated in the site logs.
- Mechanical or powered drum handling equipment will be used to move drums/containers. Manual handling of the drums leads to musculo-skeletal injuries and will be avoided to the extent possible.

1.10.3.8 Spill Response.

Spill Prevention

All vessels containing liquid waste will be secondarily contained in a container capable of holding 110 percent of the contents of the primary container, excepting the secondary containment for 55-gallon drums, which will be a container holding four drums that can contain 90 gallons. These vessels will include decontamination water in 5-gallon buckets or 55-gallon drums.

Spill Control

In the event that spill prevention is unsuccessful, spill and discharge containment/ control procedures will be implemented. These procedures address decontamination procedure waste, as well as drum and container handling, opening, sampling, shipping, and transport. Spill control material, such as absorbent paper and solids (vermiculite, or other noncombustible absorbent), drums (55-gallon U.S. Department of Transportation 17-E or 17-H), shovels, brooms, and personal PPE to clean up spills will be available with each field crew. The material used to contain the spill will be placed in Department of Transportation (DOT)-approved waste containers and will be characterized and properly disposed of. If the spill or discharge is reportable and/or human health or the environment are threatened, the National Response Center, the DTSC, and the USACE will be notified as soon as possible.

Spill Control Measures

If a spill occurs, the following actions be taken by Earth Tech:

- Notify the SSO immediately.
- Take immediate measures to control and contain the spill within the site boundaries including the following actions:
  - Isolate and contain spill areas
  - Deny entry to unauthorized personnel
  - Do not allow anyone to touch spilled material
  - Stay upwind; keep out of low areas
  - Keep combustibles away from the spilled material
  - Use water spray to reduce vapors and dust, as needed
  - Take samples for analysis to determine that cleanup is adequate
  - Other actions, as needed.

Solid Spills. Earth Tech will remove and place contaminated materials into dry containers and cover. The container is to be labeled, and its contents are to be disposed of appropriately.

Liquid Spills. The contractor will absorb all liquid spills with sand, clean fill, or noncombustible absorbent material and dispose of the absorbent/spill mixture in the manner specified under decontamination material disposal guidelines.

Discharges

For liquid discharges, Earth Tech will immediately identify the source point of discharge and take measures to eliminate further spills. The discharged material will be absorbed with sand, clean fill, or noncombustible absorbent material and disposed of in the manner specified under decontamination material disposal guidelines. If a discharge of any material that is stored in drums or holding tanks occurs, the following actions will be taken by Earth Tech to reduce potential migration to adjacent properties:

- Notify the SSO.
- Take immediate measures to control the discharge within the site boundaries or beyond the site boundaries, if necessary. These will include the following actions:
  - Contain and eliminate the discharge, if possible
  - Remove or retrieve any discharged liquids, if possible

- Isolate the hazardous area and deny entry to unauthorized personnel

- Other actions, as needed.

Notification of Spills and Discharges

If a spill occurs and people or the environment are threatened, Earth Tech will immediately notify the SSO and implement spill and discharge control. The Hazardous Waste Manifest will be signed by authorized personnel of the client. A Spill Report will be provided to the SSO no later than 7 days after the initial report, which will include but be limited to:

- Description of the material spilled including identify, quantity, and a copy of the waste disposal manifest

  - Exact time and location of the spill and description of the area involved

  - Containment procedures utilized

  - Description of the cleanup procedures employed at the site, including disposal of spill residue.

Determination if the spill is reported to the U.S. EPA and/or state and the date upon which the report to the appropriate agency was made, as well as the name of the agency representative who accepted the report. The client will be responsible for making the determination of whether or not a report to regulatory agencies is necessary; however, Earth Tech may be required to file the report.

1.10.3.9 Heat Stress Prevention.

Heat stress can be a significant field site hazard, especially for workers wearing protective clothing. Depending on the ambient conditions and the work being performed, heat stress can occur very rapidly, within as little as 15 minutes. Site personnel will be instructed in the identification of a heat stress victim, the first-aid treatment procedures for the victim, and the prevention of heat stress casualties.

Workers should be encouraged to immediately report any difficulties or heat-related problems that they may experience or observe in fellow workers. Supervisors should use such information to alter the work-break schedule to accommodate such problems. During breaks, workers should be encouraged to drink plenty of water or other liquids to replace lost fluids and to help cool off. Should any worker exhibit signs of severe heat distress, such as profuse sweating, extreme confusion and irritability, or pale, clammy skin, that worker should be relieved of all duties at once and made to rest in a cool location and drink plenty of water. Anyone exhibiting symptoms of heat stroke (red, dry skin, or

unconsciousness) should be taken immediately to the nearest medical facility, and steps should be taken to cool the person during transportation (e.g., clothing removal, wet the skin, air conditioning). Severe heat stress (heat stroke) is a life-threatening condition that must be treated by Kaiser Permanente Medical Center (see Figure 1).

Heat Stress Monitoring

The prevention of heat stress-related accidents/illnesses is best performed through continuous observation of employees and routine heat stress awareness training activities. Heat stress monitoring can be accomplished using one of the techniques discussed in the following paragraphs.

Any results obtained from monitoring techniques should be used as guidance only. To properly mitigate the effects of heat stress, it is necessary to establish a work routine that incorporates adequate rest periods to allow workers to remove protective clothing, drink fluids (vital when extreme sweating is occurring), rest, and recover. The frequency and length of such work breaks must be determined by the individual work location supervisor based upon factors such as the ambient temperature and sunshine, the amount of physical labor being performed, the physical condition of the workers, and protective clothing being used. While heat stress measurement techniques provide guidance in optimizing this routine, breaks must always be sufficient to prevent workers from manifesting symptoms of heat stress, regardless of monitoring results.

Heat-Related Illnesses

The following guidance can be used in the identification and treatment of heat related illness.

Heat Stress. The mildest form of heat-related illness. Victims exhibit irritability, lethargy, and significant sweating. The victim may complain of headache or nausea. This is the initial stage of overheating, and prompt action at this point may prevent more severe heat-related illness from occurring.

First Aid: Provide the victim with a work break during which he/she may relax, remove any excess protective clothing, and drink cool fluids. If an air conditioned spot is available, this is an ideal break location. Once the victim shows improvement, he/she may resume working; however, the work pace should be moderated to prevent recurrence of the symptoms.

Heat Exhaustion. Usually begins with muscular weakness, dizziness, nausea, and a staggering gait. Vomiting is frequent. The bowels may move involuntarily. The victim may become very pale, with clammy skin, and he or she may perspire profusely. The pulse may become weak and fast; breathing may become shallow. The victim may faint unless he/she lies down.

First Aid: Immediately remove the victim from the work area into a shady or cool area with good air circulation (avoid drafts or sudden chilling). Remove all protective outer wear. Call a physician. Treat the victim for shock. (Make the victim lie down, raise his or her feet 6-12 inches, and keep him or her warm, but loosen all clothing.) If the victim is conscious, it may be helpful to give him or her sips of water. Transport victim to a medical facility as soon as possible.

Heat Stroke. This is the most serious of heat illness, and represents the collapse of the body's cooling mechanisms. As a result, body temperatures often rise to between 105 degrees (°)-110° Fahrenheit (F). As the victim progresses toward heat stroke, symptoms such as headache, dizziness, nausea, and oppression can be noted, and the skin is observed to be dry, red, and hot. Sudden collapse and loss of consciousness follows quickly, and death is imminent if exposure continues. Heat stroke can occur suddenly.

First Aid: Immediately evacuate the victim to a cool and shady area. Remove all protective outer wear and all personal clothing. Lay the victim on his or her back with the head and shoulders slightly elevated. Apply cold wet towels, ice bags, etc., to the head, armpits, and thighs. Sponge off the bare skin with cool water or rubbing alcohol, if available, or even place the victim in a tub of cool water. The main objective is to cool without chilling the victim. Give no stimulants or hot drinks. Since heat stroke is a severe medical condition requiring professional medical attention, emergency medical help should be summoned immediately to provide on-site treatment of the victim and proper transport to a medical facility.

Skin Hazards

Sunburn and prickly heat are both symptoms of skin irritation/damage produced through exposure to sunlight and operating in hot work environments. Protect exposed skin with an appropriate sun-screen. A sun-screen with a sun protection factor (SPF) of 15 or greater is recommended for a full day in the sun. Heat rash, also known as prickly heat, can be prevented by the application of a hydrophobic, water-repellent barrier cream such as Kerodex 71.

1.10.3.10 Cold Stress.

Cold injury (frostnip, frostbite, and hypothermia) may impair a person's ability to work. Low temperatures and wind chill factors should be considered. Adverse and cold climatic conditions are important considerations in planning and conducting site operations. Ambient temperature effects can include physical discomfort, reduced efficiency, personal injury, and increased accident probability.

Control Measures

Dead air space between the warm body and clothing and the outside air is essential. Clothing is worn to keep body warmth in and cold out. Usually, no one type of clothing is best for all weather conditions. Denim is relatively loose woven, and not only allows water to penetrate, but permits wind to blow away the body heat that should remain trapped between the body and clothing. Duck or goose down is good for stopping wind, but is of little use when wet. Plastic or closely woven nylon is good protection from wind and rain, but offers little insulation against cold.

Many layers of relatively light clothing with an outer shell of windproof material maintain body temperature much better than a single, heavy, outer garment worn over ordinary indoor clothing. The more air cells each of these clothing layers has, the more efficiently the body is insulated against heat loss. It is essential that clothing allow some venting of perspiration because wet skin will freeze more rapidly than dry skin. Use all feasible means to keep as dry as possible. Make full use of windbreaks, and avoid exposing skin to the direct effects of wind. The need to wear layers of special clothing may make the wearer very clumsy in performing many routine work procedures. Increased body dimensions must also be considered if tight spaces are encountered. Ensure water consumption is adequate and encouraged. Fluid intake is often neglected in cold weather.

To guard against potential cold stress hazards that could impair ability to work or cause cold injuries, field personnel are advised to

- Wear appropriate cold weather clothing in multiple layers that can be removed as needed
- Carefully schedule work and rest periods to warm the body
- Familiarize themselves with available warm shelters that can be used during breaks
- Use the buddy system to monitor workers' physical condition.

Hypothermia. Hypothermia is the significant loss of body heat. It is a potential hazard whenever cold weather operations are conducted. Hypothermia can be prevented by wearing insulated garments in layers. Chills, pale or cold skin, muscle rigidity, depressed heart rate, and/or disorientation may be signs of early hypothermia.

There are degrees of hypothermia characterized as "moderate" and "severe." A victim suffering from moderate hypothermia may exhibit the signs listed below; the victim will often be conscious but confused. Severe hypothermia is characterized by extremely cold skin; loss of consciousness; faint pulse; and shallow, infrequent, or apparently absent respiration. If the condition is not properly treated, death can result. The onset of severe shivering signals danger to personnel. Any worker who is shivering severely will immediately be moved to a warmer environment.

Signs of hypothermia:

- Severe shivering
- Abnormal behavior
- Slowing of movements
- Stumbling
- Weakness
- Repeated falling
- Inability to walk
- Collapse
- Stupor
- Unconsciousness.

Personnel will be removed from exposure to cold upon the onset of any symptoms associated with hypothermia. Additional emergency procedures include:

- Seek immediate expert help.
- Reduce handling to a minimum. Do not rub or massage the victim.
- Prevent further body heat loss by covering the victim lightly with blankets. Plastic may be used for further insulation. Do not cover the victim's face.
- If the victim is still conscious, administer hot drinks. Encourage activity, such as walking while wrapped in a blanket. Do not administer any form of sedative, tranquilizer, or analgesic (pain reliever), because these may cause heat loss and elevate a moderate case of hypothermia to a severe case.

Chilblain. Chilblain is an inflammation of the hands and feet caused by exposure of the extremities to cold, moist environments. It is characterized by recurrent, localized itching, swelling, and painful inflammation of the fingers, toes, or ears produced by mild frostbite. Such a sequence produces severe spasms accompanied by pain. Insulated gloves and footwear are essential in preventing injury to hands and feet.

1.10.4 Lighting

At a minimum, all portions of each work location will be sufficiently lit so that all surfaces are illuminated at 10-foot candle strength or greater. Since OE work activities are expected to be conducted exclusively outdoors and during daylight hours, the need for supplemental lighting is not anticipated.

1.10.5 Accident or Incident Reports

All accidents and incidents that occur on site during any field activity will be promptly reported to the HSO.

If any Earth Tech employee is injured and requires medical treatment, Earth Tech's Worker's Compensation Adjuster, Sedgwick CMS (877-261-8926) will be notified. The Site Safety Officer will initiate a written report, using the *Supervisor's Report of Incident* form (see Attachment G). The SSO will complete the first two sections and forward to the PM. The PM will complete Section 3 and forward it to the HSO within 24 hours of the incident.

If any employee of a subcontractor is injured, documentation of the incident will be accomplished in accordance with the subcontractor's procedures; however, copies of all documentation (which, at a minimum, must include the OSHA Form 101 or equivalent) must be provided to the HSO within 24 hours after the accident has occurred.

The HSO will review the documentation and will assist in the performance of any necessary accident investigation or other follow-up. The PM will ensure that the recommendations resulting from any investigation are implemented without delay.

1.10.6 Visitor Clearances

Visitors will not be allowed within any controlled work area unless they comply with the health and safety requirements of the OE SSHP and can demonstrate an acceptable need for entry into the work area. All visitors (including the site owner or the owner's representative, regulatory agency representatives, or Earth Tech clients) desiring to enter any controlled work area must be briefed on the hazards associated with the site activities being performed and must acknowledge receipt of this briefing by signing the appropriate tailgate safety briefing form.

If the site visitor requires entry to any exclusion zone, but does not comply with the above requirement, all work activities within the exclusion zone must be suspended. Until these requirements have been met, entry will not be permitted.

1.11 ACTIVITY-SPECIFIC HEALTH AND SAFETY PROCEDURES

The following safety procedures will apply to work operations as specified in the THAs presented in Section 1.9.

1.11.1 Slips, Trips, and Falls, and Protruding Objects

Hazards from protruding objects, careless movements, or placement of materials on paths or in foot traffic areas present a problem with regard to slips, trips, and

falls, and puncture wounds. Personnel will use a reasonable amount of effort to ensure the prevention of such injuries.

1.11.2 Hazardous Noise Safety

Working around large equipment often creates excessive noise. The adverse effects of noise can include physical damage to the ear, pain, and temporary and/or permanent hearing loss. Workers can also be startled, annoyed, or distracted by noise during critical activities.

Earth Tech has compiled noise monitoring data indicating that work locations within 25 feet of operating heavy equipment (e.g., earthworking equipment) can result in exposure to hazardous levels of noise (levels greater than 85 decibel, A-weighted sound level [dBA]). Accordingly, all personnel are required to use hearing protection (e.g., ear plugs, ear muffs) within 25 feet of any operating piece of heavy equipment.

The HSO may also choose to monitor employee exposure to hazardous noise levels as part of Earth Tech's Hearing Conservation Program.

1.11.3 Heavy Machinery

The use of heavy earthworking machinery (e.g., excavators/backhoes, bulldozers) poses significant hazards if equipment is not maintained in good working order. In order to assure that all equipment used on site presents no unwarranted safety hazards, the owner/operator of each piece of heavy equipment must perform a safety evaluation and certification. Instructions and a copy of the submittal form can be found in Attachment I.

Working around heavy equipment poses considerable hazards to pedestrian workers and operators of light vehicles. To minimize the hazards, the following requirements will be observed:

1. Operators are responsible for the safe use of their equipment, and must be aware of the location of unprotected personnel at all times while operating this machinery to avoid serious accidents.

2. To improve visibility to operators, all personnel working in an area where heavy equipment operations are ongoing will wear a high-visibility traffic safety vest.

3. Light vehicles (e.g., trucks, tractors) on the Project Site will be equipped with orange flags that extend to a height of at least 8 feet above ground. Vehicles equipped with headlights will activate them at all times when moving.

4. Use of project-constructed haul roads by light vehicles will require coordination with equipment operators to minimize the potential for vehicle accidents.

1.11.4 Hand and Portable Power Tool Safety

The use of hand tools during field operations is a potential source of accidents. Portable power tools (e.g., chainsaws) are not anticipated to be utilized frequently during field activities. However, a fundamental program of using the right tool in a correct manner, together with proper maintenance and storage, is necessary to prevent personal injury and property damage. The following procedures should be observed:

- Access to hand-held and portable power tools should be controlled to prevent use by unauthorized personnel.
- Appropriate PPE should be used by personnel using safety features (e.g., guards). Guards are not to be removed or rendered inoperative unless written permission is obtained from the HSO.
- The Earth Tech SSO should establish and conduct periodic inspections of hand and portable power tools used at the site.
- The Earth Tech SSO should remove from use any damaged, worn, or improper tool.

1.11.5 Operation of an All-Terrain Vehicle

The following requirements will be observed during the operation of tow-tractors and 4-wheel-drive all-terrain vehicle (ATV):

- The vehicle should be operated only by personnel approved by the PM, and only after they have read the operator's manual.
- Protective glasses, gloves, and appropriate footwear should be worn by all occupants, as well as appropriate clothing to protect operator(s) from the weather.
- An observer should accompany the driver during the off-road (i.e., off-pavement) operation. The driver should monitor the vehicle's forward progress, while the observer should monitor for any hazards the vehicle may encounter.
- No passengers, other than the observer, should be allowed to ride on the vehicle.
- The vehicle should be fitted with a fire extinguisher and first aid kit.

- Vehicle refueling should be conducted only within a designated refueling area.

- The vehicle should be operated only during daylight hours.

- Vehicle operators should be in radio communication at all times with the Command Post and other personnel working within designated fieldwork areas.

1.11.6 Underground Utilities

Various forms of underground utility lines or pipes may be encountered during intrusive work activities. Underground Service Alert (USA) will be contacted at least 48 hours prior to the start of intrusive operations.

Should intrusive operations cause equipment to come into contact with utility lines, the SSO and the HSO will be notified immediately, and a Supervisor's Report of Incident will be completed. Work will be suspended until the appropriate actions can be taken for the particular situations assessed.

1.11.7 Electromagnetic Emissions Safety

Electronic fusing devices used in many types of ordnance devices are sensitive to emissions of electromagnetic radiation (EMR). Since many of the communication devices and investigation equipment employed on site emit or generate EMR, there is the potential for use of these devices to cause accidental detonation of OE, which may be present on site. To prevent this, the following procedures will be followed:

- An assessment of the safe separation distance (SSD) associated with each transmitter unit (e.g., radios, cellular telephones) will be conducted using the Hazards of Electromagnetic Radiation to Ordnance (HERO) methodology found in Attachment F.

Any device with an SSD greater than 4 feet will not be permitted for use on site until a complete characterization of on-site OE has been conducted. Once characterization has been completed, devices with SSDs exceeding 4 feet can be used at distances greater than the calculated SSD from any identified OE items/areas. No device will be operated at a distance closer than its SSD from any identified OE.

- SSD calculations will be performed on site by the SSC for all emission sources. All use of geophysical instrumentation on the site will be in accordance with Chapter 4.0 of the OE RDD guidelines.

Note: There is no indication or evidence from site records or subsurface sampling activities that HERO-sensitive OE were ever stored, fired, or disposed of by detonation on the Tourtelot Property. These findings are consistent for the time period that the arsenal was operating.

1.11.8 Ordnance and Explosives Safety

OE items present hazards if encountered in subsurface areas during excavations. The fundamental policy to be observed regarding OE is:

DO NOT TOUCH, HANDLE, OR OTHERWISE DISTURB ANY OE ITEM UNLESS SPECIFICALLY AUTHORIZED BY THE PM AND SUXOS.

In addition, use the following information to minimize the hazards to personnel from OE.

1.11.8.1 Ordnance and Explosives at the Project Site.

All personnel must be briefed concerning the potential for OE at the Project Site and any known identifying characteristics of OE items. Chapter 1.0 of the OE RDD provides a history of the Project Site including OE operating and type of OE which may be encountered. When moving about the site, personnel should remain alert for any OE items that might be present. Each work site should be thoroughly checked for the presence of OE before any other activities commence. In the event that any OE item is observed or expected, the following requirements will be observed:

- Personnel should note the location of the OE item and alert all other personnel in the area to its presence.
- Any work operations occurring within 20 feet of the item will cease. All Earth Tech and subcontractor employees will evacuate this area.
- Under no circumstances will any non-OE-qualified Earth Tech or subcontractor employee attempt to move or otherwise handle any OE/suspected OE item. COLLECTION OF “SOUVENIRS” IS PROHIBITED.

The OE Supervisor/OE Safety Manager will be alerted to the location of the suspected item.

1.11.8.2 OE Hazards.

OE Hazards

OE at the site increases the potential of exposing both site personnel and the general public to explosive environments and conditions. The risk of personnel

exposure to OE during site operations will be high since previous site investigations have indicated the presence of OE. In addition, the required tasking of the subcontractor to explosively dispose of any hazardous OE will expose OE personnel to the additional hazards associated with the handling of demolition supplies and demolition operations. The hazards associated with OE exposure and demolition operations include the possibility of personnel injury or death caused by explosion, fire, fragmentation, or over-pressurization. These hazards may result if OE are not properly located, identified, transported, or handled. Extreme caution and adherence to safety procedures must be exercised to minimize the hazards associated with the demolition operations used for disposal of OE. While there are no "hazard-free" procedures for the handling of OE and explosives, maximum safety will be achieved through strict adherence to operational plans, application of relevant safety procedures, and effective supervision of site operations. The procedures that will be used to safely excavate, identify, and dispose of OE found during site operations are outlined in the OE SSHP and Chapter 4.0 of the OE RDD.

General OE Safety Measures

Operations involving the potential for exposure to OE hazards shall be conducted only by, or under the supervision of, appropriately trained OE personnel. Non-OE-qualified personnel will be allowed to operate in an OE area only when escorted and directly observed by a OE-qualified technician. For the purpose of these safety measures, an OE area is defined as an area that has not been cleared of surface OE hazards and where the potential exists for encountering OE. The general safety measures listed below will be strictly followed during all OE operations:

- Before driving stakes or marker posts into the ground, a magnetometer check of that point will be performed by OE personnel to ensure the location is free of anomalies/OE.

- All personnel will require an escort to enter an OE area until that area has been surveyed and cleared of OE hazards by OE personnel.

- Once an area has been surveyed for OE and identified as free of such hazards by OE personnel other personnel may perform duties in the area unescorted, but must be escorted to and from that area if access is through non-cleared areas.

- Only OE-qualified personnel and heavy equipment operators directly supervised by UXO Technicians will be allowed in the work areas while conducting OE operations requiring an MSD. All other personnel will be located a safe distance outside the MSD from the area of operation.

- All personnel will immediately notify the nearest OE technician if a potential OE item is found. The item will not be disturbed or touched by unqualified personnel.

- Subsurface survey equipment will be tested daily and operated in accordance with the manufacturer's requirements.

Weapons Agents - Chemical

It has been determined that the Project Site should not contain chemical warfare material (CWM). If site personnel identify any items potentially containing CWM, field operations will cease, the subject area will be marked accordingly, all personnel will exit the area upwind, and the local military EOD unit will be notified immediately. OE personnel will secure the area from public access until relieved by local military EOD representatives. Fieldwork will not resume until it has been determined safe to do so.

Excavating and Trenching

Anomaly removal activities could require the excavation of soils deeper than 4 feet to determine the identity of a geophysical anomaly. If excavations deeper than 4 feet are required, they will be conducted in accordance with the following requirements. Earth Tech or their excavation subcontractor will obtain a Cal/OSHA permit prior to excavating beyond 4 feet in accordance with 8 CCR Section 341.1.

Excavation Construction Guidelines

Trenching and excavation operations will follow the safe operating guidelines presented below when trenches or excavations exceed 4 feet in depth, in accordance with the requirements of 8 CCR Section 1540.

Excavation Construction Guidelines

1. Excavated materials will be stored and retained at least 2 feet from the edge of the excavation. (Note: This procedure should be observed even when excavation/trench entry will not occur.)

2. Surface encumbrances that create a hazard will be removed or made safe before excavation is begun.

3. Based on the prior excavation activities that have occurred at the Project Site, the maximum allowable slope that will be used at the Project Site is 1:1.

4. Excavations will not exceed 20 feet in depth.

5. Materials used for sheeting, sheet piling, cribbing, bracing, and underpinning will be in good, serviceable condition.

6. Special precautions will be taken in sloping or shoring the sides of excavations adjacent to a previously backfilled excavation.

7. All ladders used in excavation operations will be in accordance with the requirements of 8 CCR Sections 1675 through 1678.

8. Excavations may be entered/exited by use of ladders or ramps. The use of buckets, forklifts, or any other machinery not designed for personnel transportation is prohibited at all times.

9. Where ramps, walkways, or bridges are used for employees or equipment, the design and construction will be accomplished by a qualified person in accordance with accepted engineering requirements.

10. When personnel are requested to be in excavations that exceed a depth of 4 feet or more, an adequate means of exit, such as a ladder or steps, will be provided.

11. Excavations will be inspected daily, or more often as conditions warrant, by a competent person to ensure that changes in temperature, precipitation, shallow groundwater, overburden, nearby building weight, vibrations, or nearby equipment operation has not caused weakening of sides and faces.

12. Dust conditions during excavation will be kept to a minimum. Wetting agents shall be used upon the direction of the SSO. (Note: This procedure should be observed even when excavation/trench entry will not occur.)

13. Field personnel shall not enter an excavation that does not meet the requirements of 8 CCR Section 1540 for any reason except to rescue injured individuals who have fallen into the excavated area.

Trench Entry Requirements

These requirements will be enforced whenever personnel are required to enter trenches or excavations:

1. Expected hazardous ground movement areas and banks more than 4 feet high will be shored, laid back to a stable slope, or equivalent.

2. Sides of trenches in unstable or soft material 4 feet or more in depth will be shored, sheeted, braced, sloped, or equivalent.

3. Sides of trenches in hard, compact soil, including embankments, will be shored or otherwise supported when the trench is deeper than 4 feet.

4. Materials used for sheeting, sheet piling, bracing, shoring, and underpinning will be in good, serviceable condition.

5. Additional precautions by way of shoring and bracing will be taken to prevent slides or cave-ins when excavations are subjected to vibrations.

6. When trenches are shored, the standard shoring system will meet the OSHA requirements.

1.11.9 Environmental Contaminant Hazards

1.11.9.1 Explosive Compounds.

Based on existing site data, it is not anticipated that significant occupational exposures can result due to chemicals present in the soils which will be encountered in this project.

TNT is the only explosive on site above the preliminary remediation goal (PRG). TNT is an explosive compound that exhibits relatively stable properties when handled correctly. It has a low sensitivity to impact and friction; therefore, it is commonly used as a military and industrial explosive. TNT has effects similar to those of other nitro-compounds. Long-term exposure to TNT may result in irritation to the gastrointestinal tract. Other indications of exposure to TNT include toxic jaundice, aplastic anemia, methaemoglobaimea (effects of oxygen deficiency), and cataract formation. Exposure routes for TNT are absorption, ingestion, and inhalation, with skin absorption being the primary cause for concern. Dermatitis is not a common illness associated with TNT exposure; however, indications are evident by orange staining of the hands, arms, and face. Papular eruption and reddening of exposed skin has also been observed as a symptom of prolonged skin exposure. The Threshold Limit Value (TLV) is 0.1 milligram per cubic meter (mg/m^3) by the American Conference of Governmental Industrial Hygienists (ACGIH), while federal OSHA has established the PEL for TNT at 0.5 mg/m^3. Both agencies have applied a “skin” notation to the exposure limits, indicating that dermal exposure is a significant potential hazard.

Protection against skin exposure can be provided by the use of chemically protective gloves and other clothing.

Note: The PM or SSO will inform all personnel prior to entering the Project Site of the potential health effects associated with the use of the medication "Viagra" on a site with explosive constituents. Personnel using Viagra are required to wear Modified Level D PPE at all times while on site. Health hazards due to dermal absorption of explosives while taking Viagra can cause severe illness and death. All personnel are required to wear at least Modified Level D PPE while performing homogenization and excavation of TNT-affected soil to prevent contact with explosive constituents.

1.11.10 Dangerous Plants

Various types of thistle and stinging nettle grow within the designated fieldwork areas. Personnel should avoid these plants if possible. Should work be conducted in areas where these plants are present, standard Level D PPE will reduce, but not eliminate, the risk of injury. In the case of laceration or puncture, simple cleansing of the wound to remove dirt and plant material is usually sufficient. If a thorn or needle remains, seek medical attention to have it excised. Tetanus prophylaxis may be appropriate following removal of deeply imbedded plant fragments.

The most common type of skin trauma, after needle picks, results from contact with plants in the poison ivy family. Personnel should avoid plants in the poison ivy family if possible. Plants within the poison ivy family include poison ivy, poison oak, and poison sumac. Should work be conducted in areas where these plants are present, standard Level D PPE will reduce, but not eliminate, the risk injury.

One or more contacts with the plant may be necessary before an individual becomes sensitized. The severity of the response varies greatly among personnel sensitized to the allergen. The degree of reaction depends on the amount of allergen, the size of the exposure area, and whether the skin is toughened with calluses at the exposure site. Response at the site of contact may be delayed 12 to 48 hours. The first sign of exposure is reddening of the skin, frequently followed by raised welts. The rash is usually limited to the area of contact, but previous reaction sites may flare. During the next 24 hours, blisters containing nonallergenic, clear fluid form, which cannot spread the rash. Some fluid may weep from the blisters. Intense itching is a prominent and consistent feature of allergic-contact dermatitis. Crusting and scaling begin within a few days and, in the absence of complications or continued exposure, the dermatitis rarely lasts longer than 10 days. Allergic-contact dermatitis affecting eyelids or scrotum is usually expressed as diffuse, raised red blotches. The soles, palms, and hair or scalp are rarely affected.

The best prevention is to avoid contact with the plants. However, if the skin does contact the plant, the dermatitis may be avoided by prompt removal of the allergen. About 10 minutes are required for penetration of the cutaneous by the allergen. Washing the affected area with running water is recommended to remove the allergen, but avoid the use of soap. Soap removes protective skin oils and may cause or hasten penetration of the allergen. Avoid nonpolar solvents,

such as alcohol, which may spread the allergen over a wider area. Early application of topical steroids can minimize the severity of the dermatitis. If the face or genitalia is involved, seek professional medical help within 6 hours of exposure.

The allergen may be carried by other objects such as tools or clothing. Personnel should avoid touching the face or genitalia with unwashed hands after possible exposure. Burning poison ivy produces smoke particles that carry the allergen and that may produce extremely severe systemic response.

No barrier creams have been found effective in preventing penetration of the cutaneous by the poison ivy family allergen. Protective clothing that prevents skin contact should be used when there is unavoidable contact or when working in areas where there is a high likelihood of contact.

1.11.11 Dangerous Animals

The Project Site supports some types of dangerous animals (e.g., snakes, stinging insects), and personnel should be alert to their presence. When contact with these animals is made, the following measures should be taken.

1.11.11.1 Stinging Insects.

Avoid disturbing the nest or hive of stinging insects. If bees, wasps, or hornets are disturbed, leave the area. Seek first aid for stings. Individuals with allergic reactions to bee stings should carry a doctor's prescribed bee sting kit.

1.11.11.2 Biting Insects and Spiders.

If mosquitos become a pest, use a commercially available repellent. Spider bites can usually be avoided by carefully observing for spiders when picking up objects or putting hands in enclosed spaces.

- **Black Widows** (*Latrodectus mactans*) are web spiders. The sedentary females may bite if molested. Males move about but do not bite. The Black Widow is found in most warm parts of the world. The bite may go unnoticed and may not hurt. But the subsequent severe abdominal pain from a Black Widow's bite resembles appendicitis. There is also pain in the muscles and in the soles of the feet, but usually no swelling at the site of the bite. Alternately, the saliva flows freely, then the mouth is dry. The bite victim sweats profusely. The eyelids are swollen. The patient usually recovers after several days. Physicians can relieve the severe pain by injection of calcium gluconate. Antivenom is available. No first aid treatment is available for any spider bite.
  The black widow spider is recognizable by the following characteristics: The male's abdomen is elongated with white and red markings on sides. The female's abdomen is almost spherical, the

lower abdomen is usually marked by two orange to reddish triangles resembling an hourglass. Their habitat is among fallen branches and under objects of many kinds, including furniture, outhouse seats, and trash.

- **Brown Spiders** (*Loxosceles* sp.) commonly live in structures on the floor and behind furniture. Bites occur when a spider rests in clothing or in a towel. There may be no harm at all. In very severe cases, a red zone appears around the bite, then a crust forms and falls off. In any bite from a spider known to be poisonous, it is wise to consult a physician as soon as signs of illness appear.

  The Brown Spider, also known as the Brown Recluse Spider or Violin Spider, is recognizable by the orange-yellow back with dark violin pattern. The base of its legs is orange-yellow, and the rest of its legs are grayish to dark brown. Abdomen is grayish to dark brown with no obvious patterns.

There is a possibility that ticks or fleas can be encountered in wooded areas. These insects can be present on plants and animals. Human infestation can occur as a result of direct contact. Both types of insects are mobile, and once infesting a human victim, will move to their preferred locations on the body.

Fleas will congregate in the warmer, less accessible parts of the body. The insects, while producing irritation of the skin (itching), are not directly harmful. However, they can serve as vectors (transmitters) for numerous types of diseases. Ticks will move towards the top part of the body (preferably the head), and can embed themselves into the victims skin and withdraw small amounts of blood. Once imbedded, they are extremely difficult to dislodge. As with fleas, ticks do not themselves present a significant danger; however, they too can transmit various diseases to their victims.

Protection against infestation can be accomplished by wearing long-sleeved shirts and pants, and by avoiding thickly wooded areas and contact with wild animals. Personnel should also inspect each other after working in wooded areas to spot ticks and fleas before they can become established. If a person does become infested, treatment should be provided by a medical professional. The victim should proceed promptly (but not on an emergency basis) to a medical treatment facility.

1.12 HAZWOPER PROTECTIVE ENSEMBLES

Each THA (see Attachment A) provides requirements for PPE; however, in general, personnel performing remedial activities will utilize a Modified Level D ensemble when working on the Site.

Upgrades in PPE ensembles (Level C, Level B, or Level A) are not anticipated due to the low hazard potential associated with the chemicals (see Addendum I Section 4.2). If Site conditions present a more significant inhalation or skin contact hazard than anticipated, work will cease and the HSO will be contacted for additional guidance and development of revised/supplemental documentation.

1.12.1 Level D

Level D protection is the lowest level of personal protection allowed on HAZWOPER sites. Respiratory protection is not required, since concentrations of airborne chemicals are expected to be below applicable action levels.

During HAZWOPER activities, Level D protection will be the primary level of protection worn during all operations where contact with chemically affected materials is unlikely (e.g., geophysical testing). The Level D ensemble provides minimal levels of skin protection.

Level D Equipment List

- Hard hat
- Short-sleeved shirt (tank tops are not acceptable)
- Long pants (shorts or cut-offs are not acceptable)
- Safety-toed work boots
- Safety glasses.

1.12.2 Modified Level D

If the potential exists for contact with chemically affected material (e.g., minor splashes, "dirty operations") but the respiratory hazard is low, the use of a Modified Level D ensemble is appropriate. Modified Level D consists of protective clothing to preclude hazards due to contact with chemically affected materials but does not provide increased respiratory protection. The use of Modified Level D PPE will be required for on-site operations where contact with chemically affected soils can be expected (i.e., sample collection, soil handling/containerization). The Modified Level D ensemble provides moderate skin protection against chemical contact, but no respiratory protection.

Modified Level D Equipment List

- Chemical-resistant disposable outer coveralls (e.g., Tyvek™ or poly-coated Tyvek™ coveralls)

- Chemical-resistant outer gloves (taped to outer coveralls)
- Chemical-resistant inner gloves
- Hard hat
- Short-sleeved shirt (tank tops are not acceptable)
- Long pants (shorts or cut-offs are not acceptable)
- Safety-toed work boots
- Safety glasses
- Hearing protection (as required).

1.12.3 Respiratory Protection

The use of respiratory protection is not anticipated for project-related activities based on specific work conditions. Should the use of respirators become necessary, personnel will inspect their respirators prior to and after each use. Additionally, all used filter cartridges will be discarded at the end of each day. Workers may choose to change out filter cartridges more often as they feel necessary or comfortable.

1.13 PROTECTIVE EQUIPMENT REQUIREMENTS

All use of PPE will conform to the requirements provided below. Requirements for task-specific PPE use are specified in the THAs found in Attachment A.

1.13.1 Head Protection

Project personnel will wear hard hats on the work site when working with overhead hazards.

Where necessary, ear protection and faceshields may be attached to hard hats, provided the method of attachment does not compromise the integrity of the hard hat. All hard hats shall meet the requirements set forth in American National Standards Institute (ANSI) Z89.1.

1.13.2 Eye Protection

Eye protection will be worn on work sites at all times unless otherwise directed by the SSO. All selected eye protection will meet the following minimum requirements:

- Provide adequate protection against the particular hazards for which they are designed
- Be reasonably comfortable when worn under the designated conditions
- Fit snugly and not unduly interfere with the wearer's movements
- Be durable
- Be easily cleaned and disinfected.

Where specified due to particular work conditions, eye protection must also meet the impact and durability standards set forth in ANSI Z87.1. However, where this is not specified, the use of commercial sunglasses will be permitted at work sites (due to the limited potential for high-velocity impact hazards associated with most of the work activities performed).

Persons whose vision requires correction and are required to wear eye protection may wear goggles or spectacles of one of the following types:

- Spectacles whose protective lenses provide optical correction (Rx)
- Goggles that can be worn over corrective (Rx) spectacles without disturbing the adjustment of the spectacles
- Goggles that incorporate corrective (Rx) lenses mounted behind the protective lenses.

1.13.3 Hearing Protection

Appropriate hearing protection (ear plugs, canal caps, or ear muffs) will be provided when noise may be a problem, such as around heavy machinery, power support equipment, and impact tools. All hearing protectors will provide a minimum noise reduction rating (NRR) of 25. Employees who may be exposed to hazardous noise must be participants in a hearing conservation program that meets the requirements of 29 CFR Part 1910.95.

1.13.4 Foot Protection

Employees will wear appropriate foot protection while working on site, which will consist of leather or chemical-resistant boots (as appropriate) with safety toes. All footwear must meet the specifications of ANSI Z41.1. EXCEPTION: Footwear used by UXO Technicians and geophysical technicians is not required to have a safety-toe.

1.13.5 Hand Protection

Employees will use appropriate hand protection when exposed to hazards that could cause injury to the hands. Gloves must resist puncturing and tearing as well as provide any necessary physical abrasion or chemical resistance.

Where the use of chemically protective gloves is specified below, the following items will be acceptable:

Inner Gloves

- Best Safety Model N-Dex gloves (nitrile rubber)
- Other models approved on a case-by-case basis by the HSO.

Outer gloves

- North Model Solvex gloves (nitrile rubber)
- Other models approved on a case-by-case basis by the HSO.

1.14 OVERALL SITE CONTROL

Overall control of the Project Site is the responsibility of Earth Tech. Access to the site will be secured through an entrance gate to the Project Site and will be limited to authorized personnel only.

1.14.1 Work Area Control

Earth Tech is responsible for properly controlling its work locations to prevent injury to other personnel operating at the site. To ensure that conflicts do not occur, Earth Tech will coordinate daily work activities with the other organizations performing work at the site (if any), and will inform each organization of the hazards and clearance requirements for each work activity so that they can inform/manage their personnel accordingly.

The following requirements describe the work zone control procedures to be implemented with respect to soil remediation and OE clearance activities. Additional OE-related site control measures are specified in the OE RDD.

1.14.1.1 Exclusion Zones.

Exclusion zone boundaries will be set such that all physical, noise, and chemical-related hazards are fully contained within. Unless otherwise indicated (by specific site or work conditions or by perimeter monitoring results), an area of 35 feet in all directions from each work location will be considered as the boundaries of each exclusion zone. Where feasible, boundaries of each exclusion zone will be designated using cones, yellow “CAUTION” tape, and/or other positive physical/visual barriers. However, it is recognized that during some work operations (i.e., manual excavation), the work pace will preclude use of this equipment. In such instances, visual control of the work area should be adequate

due to the limited potential for unexpected entry.

Within each exclusion zone, Earth Tech will have complete control of all operations and personnel. Only Earth Tech-authorized personnel, who must meet the training and medical monitoring requirements specified in Sections 11.1.2, will be permitted within any exclusion zone. Once an exclusion zone is established, access will be limited to qualified personnel equipped with the proper PPE.

1.14.1.2 Contamination Reduction Zone.

Since it is considered unlikely that significant soil contamination will be encountered, there is limited need for establishment of a specific contamination reduction zone (CRZ) around each exclusion zone. Instead, Earth Tech will establish designated entry/exit areas that will serve as decontamination locations.

1.15 EMERGENCY CONTINGENCY PLAN

There are four types of emergencies that could occur during performance of this project:

- Illness and physical injury
- Catastrophic event at the work site (fire, explosion, earthquake, or chemical)
- Catastrophic event involving site personnel and/or equipment.
- Catastrophic event off the worksite (Valero).

Although a catastrophic event or severe medical emergency is unlikely to occur during work activities, an emergency contingency plan has been prepared for this project should such a critical situation arise.

The PM is responsible for notifying all federal, state, and local government organizations as specified in the OE RDD. The Valero Plant is a minimum of 1,125 feet from the Project Site boundaries. The Project Manager or SSO will notify the Valero Health and Safety Department prior to initiating site activities and provide contact numbers for Valero to use to contact Earth Tech in the event of an accident at the refinery. Additionally, the PM or SSO will notify Valero in the event of an accident or incident on the Project Site.

1.15.1 Responsibilities

1.15.1.1 Site Safety Officer.

The SSO will be the primary contact individual and coordinator of all emergency activities. Responsibilities include:

- Evaluating the severity of the emergency
- Implementing appropriate response action
- Summoning appropriate emergency services (e.g., fire department, ambulance)
- Notifying all site personnel, the HSO, and concerned authorities of the emergency situation.

1.15.1.2 Other On-Site Personnel.

It will be the obligation of the field personnel to inform the SSO of all emergency situations and to abide by their issued response actions. Special medical problems of field personnel (e.g., allergies to insects, plants, prescription medication) will be reported to the SSO.

1.15.2 Emergency Equipment

Provisions will be made to have appropriate emergency equipment available and in proper working condition.

1.15.2.1 First Aid Kits.

Each work team will have access to a first-aid kit meeting the following requirements:

- First-aid kits in weatherproof containers, approved by Earth Tech's Occupational Physician and meeting all regulatory requirements, will be present at all locations where Earth Tech employees will be working.
- First-aid kits will be available at the job site at all times.
- Use of any item from the first-aid kit will necessitate completion of an Accident/Injury Report. The report will be submitted to the HSO within 1 working day of the incident.
- First-aid kits will be inspected and restocked weekly. An inventory of first-aid supplies sufficient to restock kits on a weekly basis will be maintained.
- Personnel permitted to use first-aid kits will possess a current first-aid provider card.

1.15.2.2 Fire Extinguisher.

A fire extinguisher with a minimum rating of 1A:10B:C will be available to each work team, and within 50 feet of any work location. Personnel will be made aware of the location of the nearest fire extinguisher at all times.

1.15.3 Notification and Recordkeeping

Any injury or illness will be immediately reported to the PM, who will implement any immediate corrective actions and report the incident to the HSO. OSHA requires notification within 24 hours, and preferably during the same work shift, in the event of a fatality or severe injury requiring hospitalization. The HSO will make such notifications to OSHA and consequently must receive the information in time to make the notification without penalty.

1.15.4 Response Actions - Safety Equipment Problems

An emergency may develop due to malfunction or other problems associated with use of health and safety equipment by field personnel. These equipment problems must be corrected before field activities can be continued. Health and safety problems that may occur include:

- Leaks or tears in protective clothing
- Failure of respiratory protective devices
- Encountering contaminants for which prescribed protective equipment may not be suitable.

1.15.5 Response Actions - Medical Emergencies

Medical emergencies can be described as situations that present a significant threat to the health of personnel. These can result from chemical exposures, heat stress, cold stress, and poisonous insect or snake bites. Medical emergencies must be dealt with immediately, and proper care should be administered. This may be in the form of first aid and emergency hospitalization.

Telephone numbers and locations for the local fire department, hospitals, ambulance service, and other emergency services will be maintained by the SSO (see Figure 1; Table 2). Information regarding nonemergency medical treatment for on-site injury, on-site illness, or on-site exposure to chemical contaminants will be provided to the hospital by the SSO. Communication methods available on site will be a hard-line telephone in the Command Post, cellular telephones (carried by SSO and PM), and hand-held radios.

1.15.6 Response Actions - Worksite Catastrophic Events

In the event of a catastrophic incident at the worksite:

- Work activities will cease and all project personnel will be evacuated from the work location. The evacuation will proceed in a direction opposite of the critically affected area with all personnel assembling in a predesignated location outside of the job site proper.

- A headcount will be taken of the assembled employees, and any injured individuals will be administered first aid.

- If not present at the work location, the SSO will be contacted immediately. Immediate notification of the event will be provided to the PM or HSO by the SSO.

Table 1. Contaminants of Concern by Location and Concentration Range
Page 1 of 2

Contaminant	Site	State	Low	High
2,4,6-Trinitrotoluene	TNT Strips	Solid	2 mg/kg	380,000 mg/kg
Antimony	Flare Site	Solid	2.2 mg/kg	1,470 mg/kg
Arsenic	TNT Strips	Solid	13.6 mg/kg	23 mg/kg
	Howitzer Test Facility	Solid	13 mg/kg	17 mg/kg
	Ammunition Renovation/Primer Destruction Site	Solid	13 mg/kg	16 mg/kg
	Flare Site	Solid	9.9 mg/kg	18 mg/kg
	Demolition Site #1	Solid	14.7 mg/kg	18 mg/kg
	Demolition Site #2	Solid	13 mg/kg	17 mg/kg
	Demolition Site #3	Solid	11 mg/kg	19.1 mg/kg
	Wetlands	Dissolved Solid	15 mg/kg	15 mg/kg
Barium	Flare Site	Solid	190 mg/kg	76,600 mg/kg
Copper	Flare Site	Solid	67 mg/kg	24,200 mg/kg
Iron	TNT Strips	Solid	25,000 mg/kg	50,000 mg/kg
	Howitzer Test Facility	Solid	36,000 mg/kg	47,000 mg/kg
	Ammunition Renovation/Primer Destruction Site	Solid	38,000 mg/kg	44,000 mg/kg
	Flare Site	Solid	43,000 mg/kg	66,000 mg/kg
	Demolition Site #1	Solid	42,000 mg/kg	48,000 mg/kg
	Demolition Site #2	Solid	36,000 mg/kg	47,500 mg/kg

Table 1. Contaminants of Concern by Location and Concentration Range
Page 2 of 2

Contaminant	Site	State	Low	High
	Demolition Site #3	Solid	40,000 mg/kg	48,000 mg/kg
	Wetlands	Dissolved Solid	44,000 mg/kg	44,000 mg/kg
Lead	Flare Site	Solid	11 mg/kg	46,000 mg/kg
Manganese	TNT Strips	Solid	290 mg/kg	1,900 mg/kg
benzo(a)pyrene	Ammunition Renovation/Primer Destruction Site	Solid	0.11 mg/kg	0.11 mg/kg
2,3,7,8-tetrachlorodibenzo-p-dioxin	Flare Site	Solid	1.5 pg/g	1.5 pg/g
total hexachlorinated dibenzo-p-dioxins	Flare Site	Solid	110 pg/g	110 pg/g

mg/kg = milligrams per kilogram
pg/g = picograms per gram
TNT = trinitrotoluene

Table 2. Emergency Contacts and Telephone Numbers

Fire Department 911
Fire Department - Non-emergency 745-2424

Ambulance 911
Ambulance - Non-emergency 552-1187

Police 911
Police - Non-emergency 745-3411

Information and Response Organizations

California Dept. of Health Services (Sacramento) . . . . . (916) 445-4171

EPA Region IX (San Francisco) . . . . . (415) 974-8071

Earth Tech Personnel

Health and Safety Officer
Robert Poll, CIH, CSP . . . . . (562) 951-2242
Mobile: (562) 884-1414

Project Manager
Brian Weith . . . . . (909) 554-5063
Pager: (909) 433-8488

Site Safety Officer
TBD . . . . . TBD

OE Safety Manager
Greg Peterson . . . . . (909) 554-5057
Pager: (909) 872-9839

Directions to Hospital

From the site, head south on east 2nd Street to Interstate 780. Proceed west on I-780 to Highway 80. Head north on 80 and exit at Redwood Street. Head west on Redwood and make a right onto Fairgrounds Drive. Proceed north on Fairgrounds Drive to Serrano Drive. Make a left onto Serrano and the hospital will be on the left-hand-side of the street.

Figure 1 **TBD**

SIGNATURE PAGE

I have read and reviewed the OE SSHP for the Tourtelot Cleanup Project Site. I have been instructed in the contents of this document and understand the information presented. I will comply with the provisions contained therein.

PRINT NAME	SIGNATURE	ORGANIZATION	DATE

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APPENDIX F
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